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Claims

[c1] An irradiating fluid bed reactor comprising
a reactor chamber possessing means for energy irradiation,
with at least a first opening for introducing pressurized gas and at least a second opening for gas exhaust,
the pressure of said gas selected to agitate, initiate flow, and circulate generally within said reactor a charge of particulate,
said particulate possessing a chemical component that successively absorbs, emits, and transfers by contract said energy to at least one atomic orbital energy absorptive material.

[c2] The fluid bed reactor of claim 1 wherein said particulate comprises particles that are smaller than twenty mesh openings to the square inch.

[c3] The fluid bed reactor of claim 1 whereby mechanical and timing means is provided for the introduction of a second reactant following the conclusion of said energy means absorption process.

[c4] The fluid bed reactor of claim 1 whereby the size and

configuration of said fluid bed reactor is selected to provide positive circulation in an environment of microgravity.

[c5] The fluid bed reactor of claim 1 whereby the atoms that receive the additional orbital energy are combined within molecules

[c6] The fluid bed reactor of claim 1 whereby said particulate comprises polymer beads.

[c7] The fluid bed reactor of claim 6 whereby said polymer beads are chemically attached to an energy sensitive dye.

[c8] The fluid bed reactor of claim 6 whereby said polymer beads are attached to an organic material selected for its energy absorption and transfer capability.

[c9] The fluid bed reactor of claim 8 whereby said organic material is chemically augmented and attached to said energy sensitive dye.

[c10] The fluid bed reactor of claim 1 whereby said energy means is a light source selected to be energy transfer compatible with said energy sensitive dye.

[c11] The fluid bed reactor of claim 1 whereby said energy means is a laser selected to be energy transfer compatible with said energy sensitive dye.

[c12] The fluid bed reactor of claim 1 whereby said energy means is microwave radiation.

[c13] The fluid bed reactor of claim 12 whereby the microwave energy capture capability of said polymer beads is increased by the addition of carbon nanofibers to said polymer beads.

[c14] The fluid bed reactor of claim 1 whereby said energy means is EMF and magnetic.

[c15] The fluid bed reactor of claim 1 whereby said gas provided for circulating flow is oxygen, selected of a pressure and temperature to generate singlet oxygen by energy transferred orbital excitement.

[c16] The fluid bed reactor of claim 15 whereby said fluid bed reactor is provided by magnetic means of separation and removal of singlet oxygen for utility.

[c17] The fluid bed reactor of claim 1 whereby said gas provided for circulating flow is ozone, selected of a pressure and temperature to generates singlet oxygen by energy transferred orbital excitement.

[c18] A method of producing singlet oxygen within a reactor with a gas-agitated charge comprising the steps of introducing oxygen(O_2) in a container containing poly-

mer beads attached to an appropriate dye,
providing means for irradiation, and
separating and withdrawing the singlet oxygen product by magnetic and egress means.

[c19] A method of producing singlet oxygen within two gas-agitated reactor chambers comprising the steps of
providing a first process reactor chamber with a flowing particulate comprising a polymer bead, chemically attached to naphthalene, and in addition chemically attached to dye,
providing within said first process reactor a irradiation source selected to convert in the presence of oxygen said naphthalene to endoperoxide,
providing circulating means whereby said endoperoxide containing particulate, is transferred to a second reactor chamber,
providing within said second reaction chamber means for microwave radiation heating whereby said endoperoxide is returned to its original naphthalene composition and singlet oxygen is released, and
providing recirculating means whereby said particulate is returned to said first reactor chamber.